REMARKS

This paper is intended as a full and complete response to the Office Action dated July 26, 2007, having a shortened statutory period for response set to expire on October 26, 2007. Applicant respectfully requests entry and consideration of the following amendments and remarks.

Claims 1 and 3 - 22 are currently pending in the Application.

Claims 1, 4, 9-11, 13, 16 and 19 are currently amended in this Response.

Claim 2 is currently cancelled in this Response.

I. Claim Rejections -- 35 USC § 112

The Office Action rejected claims 1-22 under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Applicant has amended Claim 1 to teach a toughened material that is formed by subjecting a diamond material to a process comprising a series of cryogenic and heated tempering treatments.

The toughened material comprises a diamond material that is a substantially continuous matrix. The diamond material has a "material temperature," which is termed such to differentiate the temperature of the diamond material from the chamber temperature of the chamber of a thermal control apparatus into which the diamond material is placed.

The preamble of Claim 1 has been amended to clarify that Applicant is claiming a toughened material comprising a diamond material.

Applicant has also amended Claim 1 to reflect that the granules within the substantially continuous matrix are granules of the diamond material.

Claim 2 has been cancelled.

Claims 3-22 depend upon Independent Claim 1. Because Applicant believes that Claim 1, as amended, properly points out and distinctly claims the subject matter which Applicant regards as the invention, and because the Office Action made no specific reference to Claims 3 through 22 as indefinite, Applicant believes that Claims 3 through 22 also properly point out and distinctly claim the subject matter which Applicant regards as the invention

The Office Action rejected claims 1-22 under 35 USC § 112, first paragraph, as failing to comply with the written description requirement.

Applicant's Claim 1, as amended, teaches a toughened material comprising a diamond material that has been subjected to a process comprising multiple cryogenic and thermal treatments.

The steps of the process are enumerated in Applicant's Claim 1, as amended, in Figure 1, and in Paragraphs [00018] and [00022] through [00030] of Applicant's Specification, as filed.

A drawing and description of a useable thermal control apparatus is provided in Figure 2, and in Paragraphs [00019] through [00021] of Applicant's Specification, as filed.

The diamond material that is thermally treated to form the toughened material can be a laminate, as described in Claim 15, which can be disposed on a ceramic, a paper, a woven fiber, a non woven fiber, a polymer, and combinations thereof, as described in Claim 16. Applicant is not claiming a method for forming a laminate. Applicant is claiming a toughened material that is formed by subjecting a diamond material to cryogenic and thermal treatments. The diamond material that is used to form the toughened material can be a laminate.

II. Claim Rejection – 35 USC § 102 and 35 USC §103

The Office Action rejected claims 1 – 22 under 35 U.S.C. § 102(b) as anticipated or, in the alternative, under 35 U.S.C. § 103(a) as obvious over *Lundin et al.* (5103701).

Applicant teaches a toughened material comprising a diamond material that has been cooled to a first target temperature at a first temperature rate, heated to a second target temperature at a second temperature rate, cooled to a third target temperature at a third temperature rate and heated to a fourth temperature at a fourth temperature rate. (Applicant's Claim 1, as amended)

Lundin et al. describe an apparatus for machining metals that detrimentally react with diamond cutting tools, in which the workpiece and diamond cutting tools are chilled to halt or retard reactions between the diamond cutting tool and the workpiece, thereby reducing wear on the diamond cutting tools. (*Lundin et al.*, Abstract)

A first refrigeration means is used to chill a diamond tipped cutting tool, and a second refrigeration means is used to chill a workpiece. (*Lundin et al.*, Column 2, Lines 30-35)

Applicant's use of cryogenic and heated tempering cycles provides a toughened material with improved structural characteristics. (Applicant's Specification, as filed, Paragraph [00028]) Further, Applicant's use of controlled rates at which the diamond material is heated and cooled prevents stressing or fracturing of the diamond material which can be caused by less controlled temperature changes. (Applicant's Specification, as filed, Paragraphs [0004] and [00022])

Lundin et al. do not teach specific target temperatures to which the diamond tipped cutting tool or the workpiece are to be cooled, *Lundin et al.* fails to teach rates of temperature change at which the items are to be cooled. *Lundin et al.* teach use of a tool and workpiece under refrigerated conditions to prevent wear on the cutting tool. Applicant's target temperatures and temperature rates of change are selected to prevent stressing or fracturing of the diamond material during repeated cryogenic and heating cycles for the formation of a toughened material with improved structural characteristics.

Further, *Lundin et al.* do not teach performing heated tempering cycles on the diamond tipped tools or the workpieces to prevent fracturing or stressing the material. *Lundin et al.* instead solely teach cooling diamond cutting tools and workpieces, during use, for the purpose of reducing wear.

Applicant teaches treating a diamond material by cooling the diamond material to a first target temperature at a first temperature rate, which avoids overstressing or fracturing the diamond material. (Applicant's Specification, as filed, Paragraph [00022]). The diamond material is then heated to a second target temperature at a second temperature rate, cooled to a third target temperature at a third temperature rate, and heated to a fourth target temperature at a fourth temperature rate. (Applicant's Claim 1, as amended).

Applicant has further included an Information Disclosure Statement being file concurrently with this Response.

Applicant appreciates the Examiner's time and attention to this matter. Applicant believes no new matter has been added with any amendments that have been made. Applicant believes claims as now provided overcome all noted rejections. Reconsideration of this application is respectfully requested.

Respectfully submitted,

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